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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,706	03/11/2004	Shamino Y. Wang	BCS03215	6174

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EXAMINER	
LIU, LI	
ART UNIT	PAPER NUMBER
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/20/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,706	WANG ET AL.	
	Examiner	Art Unit	
	Li Liu	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 17-20* is/are rejected.

7)☐ Claim(s) *15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/09/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed on 06/06/2004 is being considered by the examiner.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites the limitation "said primary switch element and said secondary switch element". There is insufficient antecedent basis for this limitation in the claim. The "said primary switch element and said secondary switch element" has not been introduced in claim 13.

Examiner Note: It is believed claim 19 was intended to depend on claim 15. With the intent to advance the prosecution of the case, the examiner interpreted that the claim 19 depends on claim 15. However, appropriated correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1- 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Persson (EP 1143646).

1). With regard to claim 1, Persson discloses an optical transmission system comprising (Figure 1):

a primary path (the working path 10 in Figure 1) disposed between a first end (e.g. node B in Figure 1) and a second end (e.g. node E in Figure 1), said primary path configured to transmit optical signals between said first end and said second end (column 4, line 13-20);

a secondary path (the protection path 20 in Figure 1) disposed between said first end (e.g. node B in Figure 1) and said second end (e.g. node E in Figure 1), said secondary path configured to transmit optical signals between said first end and said second end (column 4, line 13-20); and

a first variable ratio coupler (60 in Figure 2) coupled to said primary path (10 in Figure 2) and said secondary path (20 in Figure 2) between said first end and said second end, said first variable ratio coupler configured to adjust a coupling ratio between said primary path and said secondary path (column 5, [0025]-[0026]).

2). With regard to claim 2, Persson discloses wherein said first variable ratio coupler comprises a primary detector coupled to said primary path and a secondary detector coupled to said secondary path ([0026], the power received by the receivers in

the working and protection paths is monitored, it is inherent that the detectors are present in Persson's system so to monitor the power).

3). With regard to claim 3, Persson discloses wherein said primary detector is configured to detect optical signals transmitted along said primary path ([0026], the power received by the receivers in the working path is monitored) and said secondary detector is configured to detect optical signals transmitted along said secondary path ([0026], the power received by the receivers in the protection path is monitored).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-8, 12-14, 17, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art (AAPA, BACKGROUND and Figures 1 and 2) in view of Persson (EP 1,143,646).

1). With regard to claim 1, the AAPA discloses an optical transmission system comprising (Figures 1 and 2):

a primary path (the path 12 in Figure 1, or path 32 in Figure 2) disposed between a first end (TX in Figure 1, or 38 in Figure 2) and a second end (RX in Figure 1, or 42 in Figure 2), said primary path configured to transmit optical signals between said first end and said second end (AAPA: page 2-3, [0006]);

a secondary path (the path 14 in Figure 1, or path 34 in Figure 2) disposed between said first end (TX in Figure 1, or 38 in Figure 2) and said second end (RX in Figure 1, or 42 in Figure 2), said secondary path configured to transmit optical signals between said first end and said second end (AAPA: page 2-3, [0006]).

But, AAPA discloses switches (e.g. 22 in Figure 1 or 44 and 56 in Figure 2) coupled to said primary path and said secondary path between said first end and said second end. And the AAPA does not disclose a first **variable ratio coupler** coupled to said primary path and said secondary path between said first end and said second end, said first variable ratio coupler configured to adjust a coupling ratio between said primary path and said secondary path.

However, Persson discloses a variable ratio coupler (60 in Figure 2) coupled to a primary path (10 in Figure 2) and a secondary path (20 in Figure 2) between a first end and a second end, and the variable ratio coupler configured to adjust a coupling ratio between the primary path and the secondary path (column 5, [0025]-[0026]).

By replacing the switch with the rate adjustable coupler, the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson to the system of AAPA so that the system loss can be reduced and transmission distance can be maximized.

2). With regard to claim 2, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. And the AAPA in view of Persson further discloses wherein said first variable ratio coupler comprises a primary detector (24 in Figure 1) coupled to said primary path and a secondary detector (26 in Figure 1) coupled to said secondary path.

3). With regard to claim 3, the AAPA in view of Persson discloses all of the subject matter as applied to claims 1 and 2 above. And the AAPA further discloses wherein said primary detector is configured to detect optical signals transmitted along said primary path (24 in Figure 1, page 2-3, [0006]) and said secondary detector is configured to detect optical signals transmitted along said secondary path (26 in Figure 1, page 2-3, [0006]).

4). With regard to claim 4, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. And the AAPA further discloses wherein said primary path is configured to transmit optical signals in a normal condition (Figure 1, NORMAL OPERATION, the switch is connected to primary path 12) and said secondary path is configured to transmit optical signals in an off-normal condition (Figure 1, BROKEN PRIMARY, the switch is connected to secondary path 14).

5). With regard to claim 5, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. And the AAPA teaches that the switch module 16 is configured to switch between primary path and said secondary path responsive to a break in said primary path (page 2-3, [0006])

But the AAPA does not disclose that the first variable ratio coupler is configured to detect optical signals on said primary path and said secondary path and adjust said coupling ratio between said primary path and said secondary path responsive to a break in said primary path.

However, Persson discloses a variable ratio coupler (60 in Figure 2) coupled to the primary path and the secondary path, and the variable ratio coupler configured to adjust a coupling ratio between the primary path and the secondary path (column 5, [0025]-[0026]).

By replacing the switch with the rate adjustable coupler, the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson to the system of AAPA so that the coupling ratio between the primary and secondary paths is adjusted in response to a break in the primary path, and the system loss can be reduced and transmission distance can be maximized.

6). With regard to claim 6, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. But the AAPA does not disclose that the coupling ratio between said primary path and said secondary path is adjusted to about 100% for said secondary path and about 0% for said primary path in response to said break.

However, Persson discloses a variable ratio coupler (60 in Figure 2) coupled to the primary path and the secondary path, and the ratio of the variable ratio coupler can be adjusted to ~99% (column 5, [0023]).

By replacing the switch with the rate adjustable coupler, the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson to the system of AAPA so that the coupling ratio between the primary and secondary paths can be adjusted, and the system loss can be reduced and transmission distance can be maximized.

7). With regard to claims 7 and 8, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above.

But, the AAPA does not discloses wherein the first variable ratio coupler is configured to detect optical signals on said primary path and said secondary path and adjust said coupling ratio between said primary path and said secondary path responsive to a repair of said primary path (claim 7); and to adjust said coupling ratio from about 0% to about 100% (claim 8).

However, the AAPA teaches that detectors (e.g. 24 and 26 in Figure 1, or 62 and 64 in Figure 2) are used to detect optical signals on the primary path and the secondary path and switch the switch element from the BROKEN position to the NORMAL OPERATION in response to a repair of the primary path (page 4-5, [0010] and [0011].

And Persson discloses a variable ratio coupler (60 in Figure 2) coupled to the primary path and the secondary path, and the ratio of the variable ratio coupler can be adjusted to ~99% (column 5, [0023]).

By replacing the switch with the rate adjustable coupler, the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson to the system of AAPA so that the coupling ratio between the primary and secondary paths can be adjusted from ~0 to ~100%, and the system loss can be reduced and transmission distance can be maximized.

8). With regard to claim 12, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. And the AAPA in view of Persson further discloses wherein a link (12 or 14 in Figure 1, or, 32 or 34 in Figure 2 of AAPA) is defined between said first end and said second end, said first variable ratio coupler being configured to adjust said coupling ratio in response to a loss budget of said link (the splitting ratio of the coupler is adjusted based on the loss of the paths, [0011], [0012] of Persson).

9). With regard to claims 13 and 14, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. But the AAPA does not disclose a second variable ratio coupler coupled to said primary path and said secondary path between said first end and said second end opposite said first variable ratio coupler

(claim 13); and wherein said second variable ratio coupler is configured to adjust said coupling ratio between said primary path and said secondary path (claim 14).

However, Persson discloses a second variable ratio coupler (five nodes are shown in Figure 1, each node is equipped with a variable ratio coupler as in Figure 2, if the coupler in node B is the first variable ratio coupler, the coupler in node E can be the second variable ratio coupler, [0016]) coupled to the primary path and the secondary path, and the second variable ratio coupler configured to adjust said coupling ratio between the primary path and the secondary path (column 5, [0025]-[0026]).

By replacing the switch with the rate adjustable coupler, the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson to the system of AAPA so that the coupling ratio between the primary and secondary paths is adjusted in response to a break in the primary path, and the system loss can be reduced and transmission distance can be maximized.

10). With regard to claim 17, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 and 13 above. And the AAPA in view of Persson further discloses wherein said first variable ratio coupler and said second variable ratio coupler are configured to adjust said coupling ratio between said primary path and said secondary path (column 5, [0025]-[0026] of Persson).

12). With regard to claim 18, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 and 13 above. And the AAPA further teaches that the switch modules are configured to switch between primary path and said secondary path responsive to a break in said primary path and a primary path recovery (page 2-3, [0006], page 4-5, [0010] and [0011])

But he AAPA does not disclose wherein the first variable ratio coupler and the second variable ratio coupler are configured to adjust said coupling ratio between said primary path and said secondary path responsive to one of a primary path break and a primary path recovery.

However, Persson discloses a variable ratio coupler (60 in Figure 2) coupled to the primary path and the secondary path, and the variable ratio coupler configured to adjust a coupling ratio between the primary path and the secondary path (column 5, [0025]-[0026]).

By replacing the switch with the rate adjustable coupler, the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson to the system of AAPA so that the coupling ratio between the primary and secondary paths is adjusted in response to a break or recovery in the primary path, and the system loss can be reduced and transmission distance can be maximized.

11). With regard to claim 20, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 and 13 above. But the AAPA does not disclose that the first variable ratio coupler and the second variable ratio coupler are adjustable and configured to readjust passing 100% through said primary path responsive to a recovery of said primary path.

However, Persson discloses the variable ratio coupler (60 in Figure 1) coupled to the primary path and the secondary path, and the ratio of the variable ratio coupler can be adjusted to ~99% (column 5, [0023]).

By replacing the switch with the rate adjustable coupler, the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson to the system of AAPA so that the coupling ratio of the two couplers can be adjusted and readjusted, and the system loss can be reduced and transmission distance can be maximized.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art (AAPA, BACKGROUND and Figures 1 and 2) and Persson (EP 1,1436,46) as applied to claim 1 above, and in further view of Davis (US 6,215,565).

The AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. But the AAPA in view of Persson does not disclose a paths down alarm

configured to indicate a complete loss of system transmission responsive to both the primary detector and the secondary detector detecting a loss of signal.

However, the path down alarm due to the loss of signal has been widely used in the optical communications, Davis et al discloses such system and method (column 1 line 25-34). By the alarm signal, the network controller or management can identify the faulty and reasons et al.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the alarm signal as taught by Davis et al to the system of AAPA in view of Persson so that the system failure can be easily identified and the network management or controlling can be made easier too.

9. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art (AAPA, BACKGROUND and Figures 1 and 2) and Persson (EP 1,143,646) as applied to claim 1 above, and in further view of Krimmel et al (US 2005/0249499).

1). With regard to claim 10, the AAPA in view of Persson discloses all of the subject matter as applied to claim 1 above. And the AAPA further discloses an optical switch (e.g., 16 in Figure 1) coupled to the primary path (12 in Figure 1) and the secondary path (12 in Figure 1) opposite a coupler (the 3 dB coupler) between said first end and said second end, said optical switch configured to switch between said primary path and said secondary path responsive to the presence of optical signals (AAPA: page 2-3, [0006]).

But the AAPA in view of Persson does not disclose that the coupler is a variable ratio coupler.

However, Persson discloses a variable ratio coupler (60 in Figure 2) coupled to a primary path (10 in Figure 2) and a secondary path (20 in Figure 2) between a first end and a second end, and the variable ratio coupler configured to adjust a coupling ratio between the primary path and the secondary path (column 5, [0025]-[0026]).

And Krimmel et al also discloses an optical **switch** (the fiber switch in Figures 1-3) coupled to the working path and the redundant path (page 1, [0009]-[0013]) opposite a **variable ratio coupler** (asymmetrical splitter device in Figures 1-3) between a first end (e.g., the master node in Figures 1-3) and said second end (e.g, the station 1 or 6 in Figures 1-3), and the optical switch configured to switch between the working path and the redundant path ([0003]).

By replacing the switch with the rate adjustable coupler, Persson discloses that the system loss can be reduced (column 1 line 47-56), the transmission distance can be increased (column 2, line 10-14) and the cost of operation can reduced too (column 1 line 40-56). And Krimmel also discloses that with the variable splitting ratio, the maximum fiber span in the path protected system can be extended by up to 25% and the total costs are reduced because of the simple components ([0007])

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the variable ratio coupler as taught by Persson and Krimmel et al to the system of AAPA so that the system loss can be reduced and transmission distance can be maximized.

2). With regard to claim 11, the AAPA in view of Persson and Krimmel discloses all of the subject matter as applied to claims 1 and 10 above. And the AAPA further discloses wherein said optical switch composes:

a switch element (22 in Figure 1) in operative communication with both said primary path and said secondary path (AAPA: page 2-3, [0006]),

a primary switch detector (24 in Figure 1) coupled to said primary path, and

a secondary switch detector (26 in Figure 1) coupled to said secondary path.

Allowable Subject Matter

10. Claims 15 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claim 19 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: the present invention comprises protection of optical transmission lines with variable ratio coupler, and a primary switch coupled to the primary path and a secondary switch coupled to the secondary path. The primary switch and a secondary switch combined with the variable ratio coupler are configured to couple or decouple the primary path and secondary path so to prevent simultaneous operation of the primary

path and the secondary path. The closest prior art Persson (EP 1,143,646) and Krimmel et al (US 2005/0249499) shows a similar system and a variable ratio coupler. However, the prior art fail to discloses that the variable ratio coupler is connected to the primary switch coupled to the primary path and a secondary switch coupled to the secondary path for couple or decouple the primary path and secondary path.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ye et al (US 2005/0019031) discloses a variable splitting ratio coupler for protected passive optical networks.

Corke et al (US 5,510,917) provides an optical routes, route monitoring and protection.

Pfeiffer (US 6,925,219) discloses a PON with working and protection paths having detectors for switching.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 8:00 am - 5:30 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER

Li Liu
December 14, 2006